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Mixed Metal Oxide Aerogels for Incineration of VOC's

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ABSTRACT

Aerogels based on silica and zirconia were tested in an integral plug-flow reactor for activity in the combustion of methanol, a model compound for VOC's. Variants including zirconium and vanadium in the silica aerogel were also tested. While all of the aerogels increased removal of methanol, zirconia aerogel exhibited the highest activity and lowest light-off temperature with essentially 100% conversion to carbon dioxide. Synthesis and characterization of the aerogels will also be discussed. High resolution TEM and electron beam diffraction were used to investigate the characteristics of the aerogel structures, including the diameter of the chains and pore structure, as well as to look for phase separation and crystallinity of the active metal oxide.

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